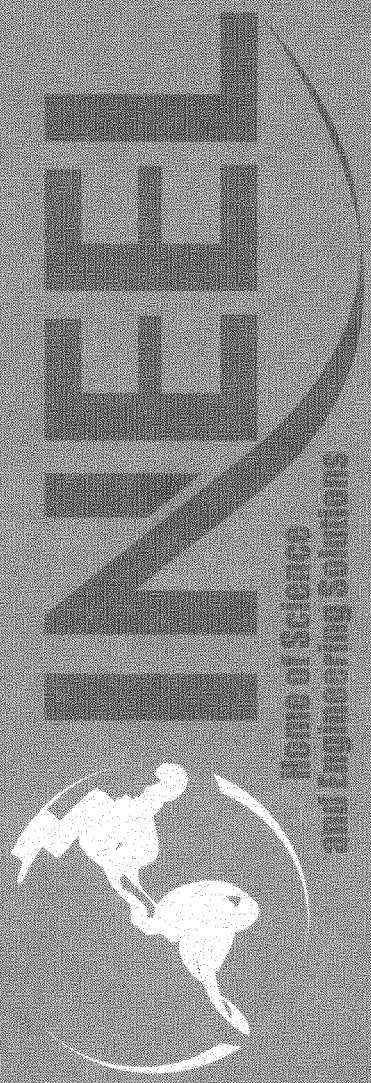
INEEL/EXT-01-01644
Revision 1

Health and Safety Plan for the Environmental Restoration Long-Term Sitewide Groundwater Monitoring

Lance W. Gurney
March 2003



Idaho National Engineering and Environmental Laboratory
Bechtel BWXT Idaho, LLC

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Health and Safety Plan for the Environmental Restoration Long-Term Sitewide Groundwater Monitoring

Lance W. Gurney

March 2003

Idaho National Engineering and Environmental Laboratory
Environmental Restoration Program
Idaho Falls, Idaho 83415

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U.S. Department of Energy
Assistant Secretary for Environmental Management
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Health and Safety Plan for the Environmental Restoration Long-Term Sitewide Groundwater Monitoring

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ABSTRACT

This Health and Safety Plan establishes the requirements and controls that will be used to eliminate or minimize health and safety hazards associated with personnel conducting long-term sitewide groundwater-monitoring activities for the Environmental Restoration Program.

This Health and Safety Plan has been prepared to meet the requirements of the Occupational Safety and Health Administration standard, 29 *Code of Federal Regulations* 1910.120/1926.65, "Hazardous Waste Operations and Emergency Response." This Health and Safety Plan contains the safety and health hazard assessment for conducting all groundwater-monitoring activities and lists controls and actions to take to eliminate or mitigate these hazards.

The intent of this document is to identify known hazards, based on previously conducted groundwater-monitoring tasks, and provide a plan for mitigating them. Safety and health professionals supporting these tasks in conjunction with the field team leader conducting these activities must determine the most appropriate hazard control and mitigation measures based on site-specific conditions and should make changes to this document, as appropriate.

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ACRONYMS

ACGIH	American Conference of Governmental Industrial Hygienists
ALARA	as low as reasonably achievable
ANSI	American National Standards Institute
ARDC	Administrative Record and Document Control
BBWI	Bechtel BWXT Idaho, LLC
CERCLA	Comprehensive Environmental, Response, Compensation, and Liability Act
CFA	Central Facilities Area
CFR	Code of Federal Regulations
CNS	central nervous system
CPR	cardiopulmonary resuscitation
CWA	controlled work area
DAR	Document Action Request
dBA	decibel A-weighted
DOE	U.S. Department of Energy
DOE-ID	U.S. Department of Energy Idaho Operations Office
DWA	designated work area
EAM	emergency action manager
EC	emergency coordinator
EPA	U.S. Environmental Protection Agency
ER	environmental restoration
ERO	Emergency Response Organization
FID	flame ionization detector
FTL	field team leader
GI	gastrointestinal
HASP	Health and Safety Plan

HAZWOPER	Hazardous Waste Operations and Emergency Response
HSO	health and safety officer
IARC	International Agency for Research on Cancer
ICS	Incident Command System
IH	industrial hygienist
INEEL	Idaho National Engineering and Environmental Laboratory
IRTL	incident response team leader
ISMS	Integrated Safety Management System
JSA	job safety analysis
LTS	long-term stewardship
MCP	management control procedure
MSDS	material safety data sheet
NFPA	National Fire Protection Association
NIOSH	National Institute of Occupational Safety and Health
NOC	not otherwise classified
NTP	National Toxicology Program
NRR	noise reduction rating
OMP	Occupational Medical Program
OSC	on-scene commander
OSHA	Occupational Safety and Health Administration
PDD	program description document
PE	project engineer
PEL	permissible exposure limit
PID	photoionization detector
PLN	plan
PM	project manager

POC	point of contact
POD	plan of the day
PPE	personal protective equipment
PRD	program requirements document
RadCon	radiological control
RCRA	Resource Conservation and Recovery Act
RCT	radiological control technician
RWP	radiological work permit
SAD	site area director
SH&QA	safety, health, and quality assurance
SS	shift supervisor
STD	standard
STEL	short-term exposure limit
TBD	to be determined
TLD	thermoluminescent dosimeter
TLV	threshold-limit value
TPR	technical procedure
TRAIN	Training Records and Information Network
TWA	time-weighted average
VD	vapor density
VOC	volatile organic compound
VPP	Voluntary Protection Program
WAG	waste area group
WBGT	wet bulb globe temperature
WCC	Warning Communications Center
WGS	Waste Generator Services

Health and Safety Plan for the Environmental Restoration Long-Term Sitewide Groundwater Monitoring

1. INTRODUCTION

This Health and Safety Plan (HASP) establishes the requirements and controls that will be used to eliminate or minimize health and safety hazards associated with personnel conducting long-term sitewide groundwater-monitoring activities under the Environmental Restoration (ER) Program. These monitoring tasks are performed to monitor the groundwater quality and identify degradation of groundwater that might originate from areas within the Idaho National Engineering and Environmental Laboratory (INEEL).

This HASP governs all tasks associated with groundwater monitoring, including well and lysimeter sampling, maintenance, abandonment, and associated subtasks. It also covers the tasks associated with drilling and well installation. All tasks will be performed by employees of Bechtel BWXT Idaho, LLC (BBWI), subcontractors to BBWI, or other U.S. Department of Energy (DOE) laboratory personnel. Personnel not normally assigned to work at the INEEL—such as representatives of DOE, the State of Idaho, the Occupational Safety and Health Administration (OSHA), and the U.S. Environmental Protection Agency (EPA)—are not considered field team members and fall under the definition of "occasional site workers," as stated in 29 *Code of Federal Regulations* (CFR) 1910.120/1926.65, "Hazardous Waste Operations and Emergency Response."

This HASP has been prepared to meet the requirements of 29 CFR 1910.120/1926.65, "Hazardous Waste Operations and Emergency Response." Its preparation is consistent with information found in the National Institute for Occupational Safety and Health (NIOSH)/OSHA/United States Coast Guard/EPA *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities* (NIOSH 1985), *Manual 14A–Safety and Health–Occupational Safety and Fire Protection, Manual 14B–Safety and Health–Occupational Medical and Industrial Hygiene*, *Manual 15A–INEEL Radiological Control Manual,* and *Manual 15B–Radiation Protection Procedures.*

The project health and safety officer in conjunction with the field team leader; necessary environmental, safety, and health professionals; and ER groundwater-monitoring personnel will review and revise this HASP to ensure its effectiveness and suitability throughout the project.

1.1 Idaho National Engineering and Environmental Laboratory Site Description

The INEEL (formerly the National Reactor Testing Station) encompasses 2,305 km^2 (890 mi^2) and is located approximately 55 km (34 mi) west of Idaho Falls, Idaho (see Figure 1-1). In 1949, the U.S. Atomic Energy Commission (now the DOE) established the National Reactor Testing Station (now the INEEL) as a site for building and testing a variety of nuclear facilities. The INEEL also has been the storage facility for transuranic radionuclides and radioactive low-level waste since 1952. At present, the INEEL supports the engineering and operations efforts of the DOE and other federal agencies in areas of nuclear safety research, reactor development, reactor operations and training, nuclear defense materials production, waste management technology development, and energy technology and conservation programs. The U.S. Department of Energy Idaho Operations Office (DOE-ID) is responsible for the INEEL and designates authority to operate the INEEL to government contractors. The current primary contractor for DOE-ID at the INEEL (i.e., BBWI) provides management and operating services to the majority of INEEL facilities.

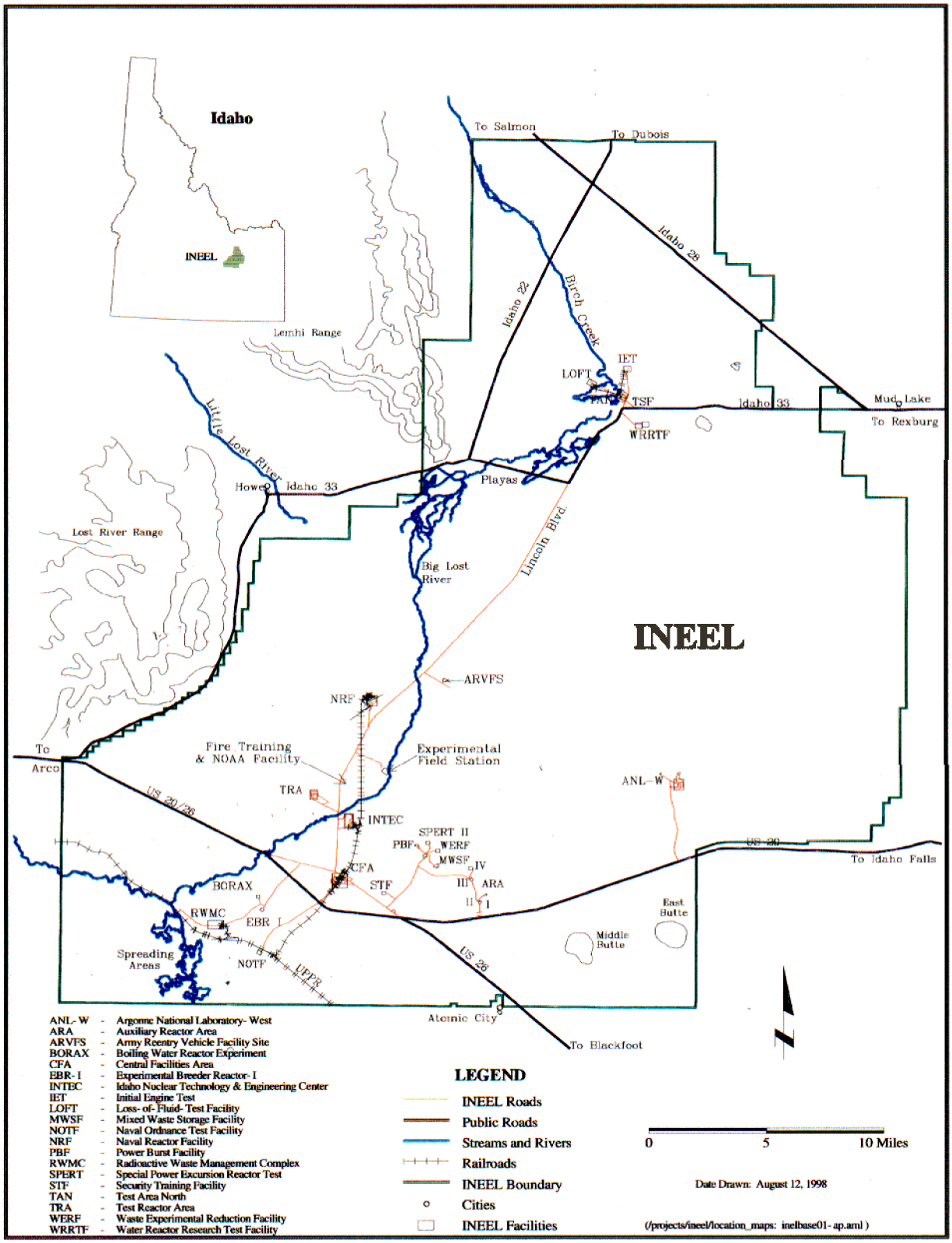

Figure 1-1. Map of the Idaho National Engineering and Environmental Laboratory showing locations of major facilities.

1.2 Project Description

Environmental Restoration covers much of the routine groundwater-monitoring activities across the INEEL. These monitoring activities take place both within and outside the fence lines of various INEEL facilities, including Test Area North, the Naval Reactors Facility, the Test Reactor Area, the Idaho Nuclear Technology and Engineering Center, the Central Facilities Area (CFA), the Radioactive Waste Management Complex, the Power Burst Facility/Auxiliary Reactor Area, and Argonne National Laboratory-West. In addition, numerous other wells are located or will be installed on the perimeter of the INEEL boundary. Figure 1-2 shows the location of all the aquifer wells at the INEEL and helps to illustrate the extent of this project.

This HASP currently covers groundwater-monitoring activities for Waste Area Groups (WAGs) 2, 4, 5, and 10. Groundwater-monitoring activities taking place at other WAGs may be added at a later date. Currently, the activities for these other WAGs are being covered by their own respective HASPs.

The objectives of this investigation are to monitor and identify any degradation of groundwater quality. These data will (1) aid in the understanding of fate and transport of contaminant migration, (2) help fill previously identified data gaps, and (3) support the selection of appropriate remedial alternatives (as applicable).

1.3 Scope

The scope of this HASP covers the collection, preservation, and shipment of water samples; the operations and maintenance (all components including surface features) of the aquifer-water well, perched-water well, lysimeter, and tensiometer; moisture infiltration monitoring using a neutron probe; soil gas vapor sampling; abandonment of wells, associated components, and systems; and where applicable, the installation of additional monitoring wells. These tasks will be accomplished with ER resources with support from applicable facility personnel. In addition, BBWI subcontract personnel may be used for specific tasks.

1.3.1 Site Preparation

When the task site is located outside a facility boundary, all notifications will be made and equipment will be collected in accordance with Management Control Procedure (MCP) -2725, "Field Work at the INEEL."

All required documentation—such as technical procedures (TPRs) and job safety analyses (JSAs), which govern the specific site tasks, as well as a controlled copy of this HASP—will be assembled and made available at the task site. In addition, all sampling and emergency equipment will be assembled at the task site (radio, fire extinguishers, personal protective equipment, containers and sampling accessories, etc.) in accordance with Section 11 of this HASP or other applicable procedure. A designated work area will be established in accordance with Section 7 of this HASP.

Equipment might require cleaning before sampling and should be performed in accordance with TPR-6575, "Decontaminating Sampling Equipment in the Field," or TPR-6541, "Decontaminating Sampling Equipment."

Then, the groundwater-monitoring wells will be accessed (as required) in accordance with MCP-2725, "Field Work at the INEEL," and inspected (as required) in accordance with TPR-6561, "Inspecting Monitoring Wells."

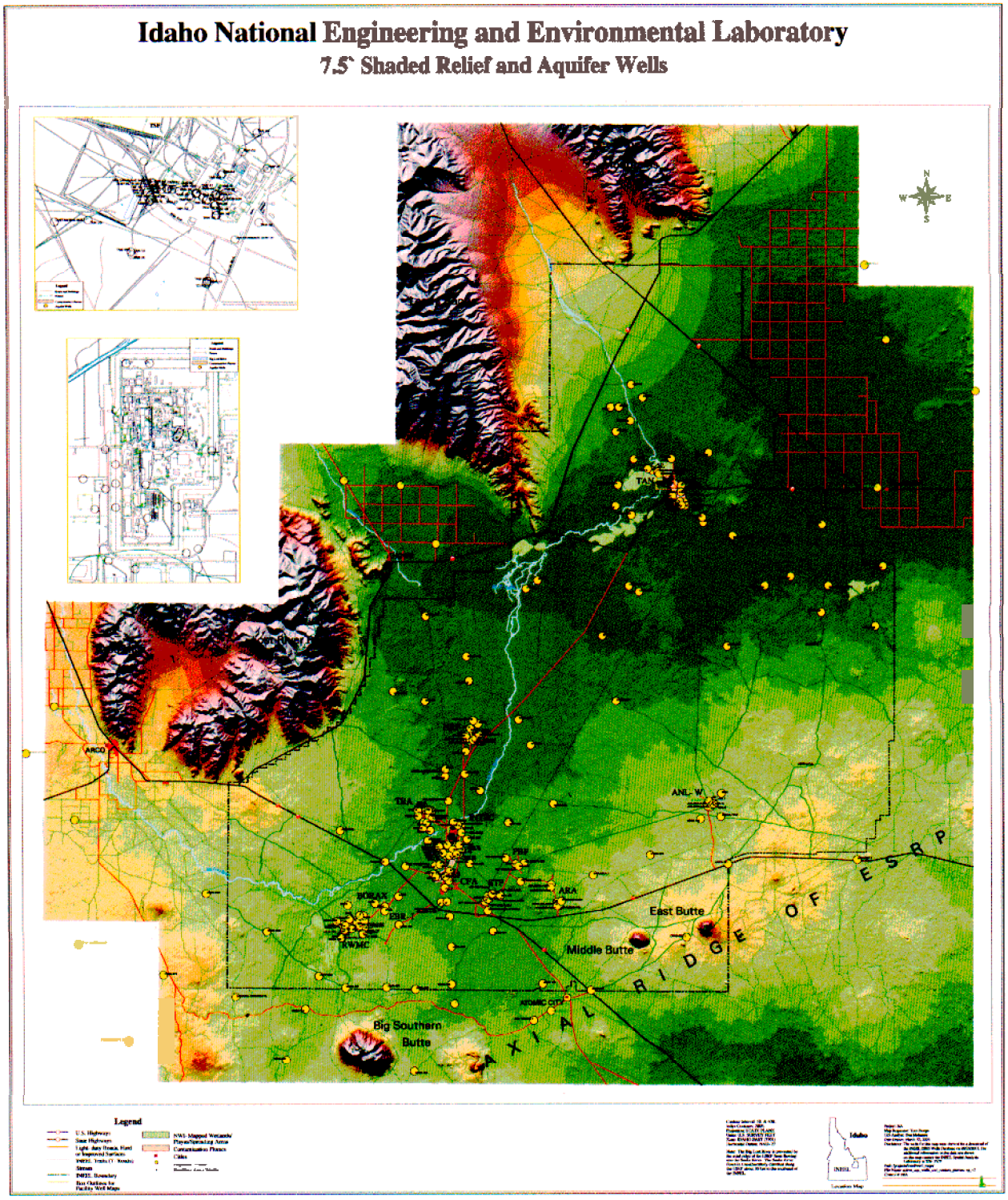

Figure 1-2. Map of the Idaho National Engineering and Environmental Laboratory showing locations of aquifer wells.

1.3.2 Groundwater Monitoring

Groundwater monitoring will take place at locations inside and outside INEEL facilities and may consist of the collection of samples using dedicated and portable pumps, measurement of water levels and water-quality parameters in the field, use of field test kits, containerization and preservation of samples for analysis, and shipment of samples to an on-Site or off-Site laboratory.

1.3.2.1 Field Measurements. Field measurements will be conducted in conjunction with sample collection and/or as a separate operation at various well sites. The following paragraphs provide a brief description of these activities.

1.3.2.1.1 Depth-to-Water—Water levels will be measured before the pump is turned on. A post-sampling water-level measurement is not required.

1.3.2.1.2 Total Well Depth—Occasional well depth verifications might need to be made if discrepancies are discovered during sampling events. This is a simple process performed by lowering a weighted measuring line into the well until the weight reaches the bottom.

1.3.2.1.3 Tensiometers—Field measurements of installed well tensiometers will be conducted to measure the matric potential (pressure head) of a porous medium, under unsaturated conditions or pressure head if saturated conditions form. Matric potential is used to calculate hydraulic gradients, determine the direction of soil water movement in the vadose zone, and calculate the rate of flow, given the hydraulic conductivity of the materials (determined from laboratory analysis of soil samples).

When the tensiometer is placed in unsaturated soil, water in the tensiometer equilibrates with the soil water in the surrounding medium. During equilibration (which could require several days), water will be pulled from the tensiometer and a change in pressure head will occur in the tensiometer. The pressure transducer will measure the vacuum in the air/water column within the tensiometer, which is in equilibrium with the surrounding medium, to determine the matric potential of the surrounding medium.

The pressure transducer is connected to a data logger using a wire lead, where measurements are stored and downloaded periodically. Downloading does not require access to the tensiometer, only the data logger.

1.3.2.2 Well Purging. Purge volumes, which are based on the depth-to-water measurement and the bottom of the well casing, will be calculated.

Note: The depth to the bottom of the well casing will not need to be measured during every sampling event. This value can be carried over from previous measurements.

For most wells, the purge water may be discharged to the ground. However, purge water from some wells might need to be containerized at the wellhead during sampling events until sampling results or other screening methods demonstrate that it can be discharged to the ground. Purge water will be managed in accordance with the guidance in Plan (PLN) -932, "Management Standard for Disposal of Wastewater (Draft),"[a] and MCP-425, "Radiological Release Surveys and the Control and Movement of Contaminated Materials," as applicable. Attention to the applicable sampling plan and facility requirements must be given to ensure that purge water is collected where necessary.

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a. PLN-932, 2003, "Management Standard for Disposal of Contaminated Wastewater (Draft)," Environmental Restoration.

During the purging operation, a Hydrolab or equivalent may be used to measure specific conductance, pH, oxygen reduction potential, dissolved oxygen, and temperature of the purge water. Following purging and collection of field measurements, groundwater samples will be collected in accordance with Program Requirements Document (PRD) -5030, "Environmental Requirements for Facilities, Processes, Materials, and Equipment," and MCP-3480, "Environmental Instructions for Facilities, Processes, Materials, and Equipment."

1.3.3 Lysimeter and Perched Water Sampling

The lysimeter is a capped tube with a permeable ceramic cup at the bottom end. Soil water is drawn and collected through the ceramic cup. The ceramic cup is manufactured to a certain pore opening size to allow liquid entry. Lysimeter tasks will include applying a vacuum to the lysimeter to draw water into the cup followed by collection of this water 5 to 14 days later. Collection of the water sample is conducted by pressurizing the system with an inert gas (generally argon). Then, the water is forced to the surface where it is collected in the sample container.

The depth of perched water will be checked and verified by using an electronic water-level indicator or a similar method. After verification, perched water samples will be collected by using a bailer or equivalent method, containerized and preserved (as required), and shipped to an on-Site or off-Site laboratory in accordance with PRD-5030, "Environmental Requirements for Facilities, Processes, Materials, and Equipment," and MCP-3480, "Environmental Instructions for Facilities, Processes, Materials, and Equipment."

1.3.4 Well, Lysimeter, and Tensiometer Maintenance and Abandonment

Existing wells, lysimeters, and tensiometers require periodic maintenance; they will be abandoned when it is deemed the location no longer serves a useful purpose. The following paragraphs provide a general description of these activities. Additional well, lysimeter, or tensiometer operation and maintenance tasks might be required during groundwater monitoring, and the paragraphs that follow are not intended to be all-inclusive. These tasks will be performed in accordance with existing procedures, procedures generated for specific activities, or a work order written in accordance with Standard (STD) -101, "Integrated Work Control Process."

Revision or additional work control documents might be required to supplement this HASP (job safety analysis [JSA], work order change, etc.) in order to address hazard identification and control of such activities.

1.3.4.1 Well Surface Completion Configuration Maintenance or Replacement. Well surface completion components (such as well heads, pads, posts, labeling, and related surface structures) will require maintenance and replacement to maintain the well operability. These tasks will be completed by using well maintenance personnel and supplemented by specific craft personnel and subcontractors, based on the nature and complexity of the activity.

1.3.4.2 Internal Well Component Maintenance or Replacement. Internal well components (such as pumps, lines, and tensiometer and lysimeter instruments and components) periodically require maintenance or replacement to maintain operability. These tasks will be completed by using well maintenance personnel and supplemented by specific craft personnel and subcontractors, based on the nature and complexity of the activity.

1.3.4.3 Well Abandonment or Decommissioning Individual Components. Wells that are damaged, deemed no longer needed based on data acquisition requirements, or have individual

components that require decommissioning will be abandoned or decommissioned to meet ER operational needs and will meet State of Idaho requirements for well abandonment. The specific requirements for abandonment or decommissioning will be described in an appropriate work control document. These tasks will be completed using existing sampling personnel and supplemented by specific crafts personnel and subcontractors, based on the nature and complexity of the activity.

1.3.4.4 Well Cleaning. Periodically, wells might need to be cleaned to remove sediment or debris that might hinder the normal operation of the well or its components. This may be performed in a variety of ways including, but not limited to, the following: (1) using compressed air to blow water out of the well, (2) "jetting" water or air into the well under high pressure to blow out existing water and debris, or (3) using a surge block to force water through the well screen and into the casing, then blowing the water out through the top of the well. Some cleaning methods require a certain amount of water in the well to be effective. In some cases, uncontaminated water might need to be added to the well before cleaning can be performed.

1.3.5 Well Installation

Some areas might require the installation of additional wells to meet monitoring requirements and data needs. The specific requirements for installing additional wells will be described in an appropriate work control document. Well installation will be completed in accordance with State of Idaho requirements. Drilling will only be performed by qualified company or subcontract personnel.

2. KEY SITE PERSONNEL RESPONSIBILITIES

The organizational structure for this project reflects the resources and expertise required to perform the work while minimizing risks to worker health and safety, the environment, and the public. Key project positions at the INEEL and within the ER Program structure are outlined in the following sections.

2.1 Environmental Restoration Program and Project Management

2.1.1 Environmental Restoration Director

The INEEL ER director has the ultimate responsibility for the technical quality of all projects, for maintaining a safe environment, and for the safety and health of all personnel during field activities performed by or for the ER Program. The ER director provides technical coordination and interfaces with the DOE-ID Environmental Support Office. The ER director ensures that:

- Project and program activities are conducted according to all applicable federal, state, local, and company requirements and agreements
- Program budgets and schedules are approved and monitored to be within budgetary guidelines
- Personnel, equipment, subcontractors, and services are available
- Direction is provided for the development of tasks, evaluation of findings, development of conclusions and recommendations, and production of reports.

2.1.2 Environmental Restoration Safety, Health, and Quality Assurance Manager

The ER safety, health, and quality assurance (SH&QA) manager (or designee) is responsible for managing SH&QA resources to ensure that SH&QA programs, policies, standards, procedures, and mandatory requirements are planned, scheduled, implemented, and executed in the day-to-day operations for ER Program at the INEEL. The manager directs the SH&QA compliance accomplishments of all activities by providing technical and administrative direction to subordinate staff and through coordination with related functional entities. The ER SH&QA manager reports directly to the ER director. Under the direction of the ER director, the ER SH&QA manager represents the ER directorate in all SH&QA matters. This includes responsibility for ER SH&QA management compliance and oversight for all ER Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) operations; decontamination, dismantlement, and decommissioning operations; and ER INEEL-wide environmental monitoring activities planned and conducted at all WAGs.

The ER SH&QA manager is responsible for managing the following matrixed or facility-provided technical disciplines and implementing the programs related to these disciplines:

- Radiological control (RadCon)
- Environmental support
- Industrial safety
- Fire protection
- Quality assurance

- Industrial hygiene
- Emergency preparedness.

2.1.3 Project Engineer

The project engineer (PE) is responsible for executing the project's technical work. This includes, but is not limited to, the following:

- Supervising engineers to ensure that timely, cost-effective engineering and design services are performed in accordance with project orders and directives, using sound engineering practices and high technical standards
- Providing technical resource and schedule integration, establishing priorities, and identifying and requesting resources necessary to accomplish work objectives for all assigned engineering and design activities
- Ensuring that the work performed is clear, concise, and executable by working with the customer and the project manager (PM) to establish firm project/task requirements
- Developing project technical execution strategy and ensuring that cost-effective design solutions are developed in accordance with safety, environmental, and quality objectives
- Reviewing project status and variance and providing corrective actions
- Resolving conflicts regarding project requirements and project team members' comments on design, including defending and selling design positions to the project team and the Agencies
- Coordinating all ER project designs with the appropriate site area director's (SAD's) engineering manager.

In addition, the PE is responsible for the project's technical staffing, which includes serving as an interface between the PM and the appropriate functional managers of the organizations providing the technical staff. The PE shall be accountable to the PM for all cost and schedule performance of the assigned technical tasks and to the functional managers for the technical quality of a project's work products.

2.1.4 Environmental Restoration Long-Term Stewardship Project Manager

The ER Long-Term Stewardship (LTS) PM is responsible for developing and managing the ER LTS Program. The ER LTS PM ensures that:

- The ER LTS Program operations, *Federal Facility Agreement and Consent Order for the Idaho National Engineering and Environmental Laboratory* (DOE-ID 1991) compliance support, surveillance, and monitoring activities are conducted according to all applicable federal, state, local, and company requirements and agreements
- Following remedial actions, the WAGs are transitioned into the LTS Program for long-term implementation
- Program budgets and schedules are approved and monitored to be within budgetary guidelines

- Direction is provided for the development of ER LTS tasks, evaluation of findings, development of conclusions and recommendations, and production of reports.

2.1.5 Integrated Groundwater Monitoring Lead

The integrated groundwater monitoring lead is responsible for the scope, schedule, budget, and technical quality for long-term ER groundwater-monitoring activities. The groundwater monitoring lead is responsible for the technical content and quality of all project deliverables. Additional responsibilities include:

- Providing technical oversight, direction, and acceptance of environmental products developed by groundwater project teams
- Ensuring the overall technical quality of project deliverables
- Monitoring and performing groundwater-monitoring field activities in accordance with the established cost and schedule
- Identifying startup requirements of new groundwater-monitoring field activities and completing required management self-assessment(s) or readiness assessment(s).

2.1.6 Environmental Compliance

The assigned ER environmental compliance coordinator oversees, monitors, and advises the WAG manager or field team leader (FTL) performing site activities on environmental issues and concerns by ensuring compliance with DOE orders, EPA regulations, and other regulations concerning the effects of site activities on the environment. The project environmental compliance coordinator provides or arranges for environmental support services for hazardous waste storage, transport, and disposal through Waste Generator Services (WGS).

2.1.7 Quality Engineer

The assigned ER quality engineer provides guidance on the project quality issues, when requested. The quality engineer periodically may observe task site activities and verify that site operations comply with the quality requirements pertaining to those activities. The project quality engineer reviews quality-significant procurement documents to ensure that adequate ordering criteria are specified for materials procured in support of the project. Receipt inspection of procured materials is performed by procurement quality.

2.1.8 Safety, Health, and Quality Assurance Point of Contact

The SH&QA point of contact (POC), or designee, is responsible for the following:

- Preparing the project HASP
- Coordinating portions of the work controls (where needed)
- Overseeing safety and health aspects of the field activities
- Ensuring that project personnel meet all training requirements.

The SH&QA POC reports directly to the PM and is accountable to the PM for cost and schedule performance of project SH&QA tasks. The SH&QA POC ensures that safety and health requirements are incorporated into documents directing field activities and for construction quality of field activities (as applicable).

2.2 Task Site Responsibilities

2.2.1 Field Team Leader

The FTL represents the ER organization at ER groundwater-monitoring sites with delegated responsibility for the safe and successful completion of the project tasks. The FTL will manage groundwater-monitoring operations and execute the applicable field sampling plans, technical procedures, and other project-specific documents. Generally, the FTL also will serve as the sampling FTL for all groundwater-monitoring tasks and may serve as the health and safety officer (HSO), based on their qualifications and the complexity of the activities. The FTL enforces site control, documents activities, and conducts (or may delegate to appropriately trained alternate) the daily plan-of-the-day (POD) meeting or prejob briefing at the start of the shift. Health and safety issues must be brought to the FTL's attention. The FTL will report project status on a regular basis to the Operations and Integrated Groundwater leads. Additional responsibilities include, but are not limited to, the following:

- Ensuring that all groundwater-monitoring field activities are conducted in compliance with the Integrated Safety Management System (ISMS) requirements and associated work orders or procedures
- Ensuring that field team personnel comply with facility and operations requirements
- Obtaining and coordinating all resources needed to implement the groundwater-monitoring fieldwork, including equipment, labor, and administrative and technical permits and approvals
- Coordinating with the applicable WAG or facility interface to schedule groundwater-monitoring tasks through the facility POD meeting, as necessary
- Ensuring that notations, comments, records, and the field logbook are completed adequately
- Directing subcontract personnel supporting the groundwater-monitoring tasks at the project sites.

If the FTL leaves the site, an alternate individual will be appointed and communicated to all field personnel. Persons acting as FTL must meet all the FTL training requirements outlined in Section 4.

2.2.2 Sampling Team

The sampling team will consist of the FTL and support personnel and is responsible for the collection, preservation, and shipment of all groundwater-monitoring samples in accordance with the applicable field sampling plan and technical procedures. The industrial hygienist (IH), radiological control technician (RCT), and safety professional will support the sampling team (as required), based on site-specific hazards and task evolutions. The sampling team will be led by a sampling FTL who also may perform other roles during the project.

2.2.3 Specialty Subcontractors

Specialty subcontractors may be used to support certain groundwater-monitoring maintenance, repair, well installation, and abandonment tasks. A subcontractor lead will serve as the single POC for all subcontractor safety issues at the site and will report to the FTL for all technical direction and interface issues at the project site. Subcontractor personnel will report any health and safety issues that arise to the FTL or HSO and may stop work if an unsafe condition exists. The subcontractor lead also will be asked to provide hazard and mitigation information regarding the nature of their equipment or operations during the POD meeting and may participate in job-site hazard walk-downs, where appropriate.

2.2.4 Field Team Members

All groundwater monitoring field team members, including facility and subcontractor personnel assigned to operational support roles, will understand and comply with the requirements of this HASP. The FTL (or designee) will conduct a formal prejob briefing or POD meeting at the start of each shift. All daily tasks, associated hazards, hazard mitigation (i.e., engineering and administrative controls, required personal protective equipment, and work control documents), and emergency conditions and actions will be discussed during the POD briefing. Input from the project HSO, IH, and safety personnel (where assigned) will be provided to clarify task health and safety requirements, as deemed appropriate. All project personnel are encouraged to ask questions regarding site tasks and provide suggestions on ways to perform required tasks in a more safe and effective manner based on lessons learned from previous groundwater-monitoring activities.

Once at the groundwater-monitoring project site, personnel are responsible for identifying any potentially unsafe situations or conditions to the FTL or HSO for corrective action.

Note:	If it is perceived that an unsafe condition poses an imminent danger, site personnel are authorized to **STOP WORK immediately** and notify the FTL or HSO of the unsafe condition.

2.2.5 Nonfield Team Members

All persons who are at a groundwater-monitoring site during operations and are not part of the field team (e.g., surveyor or others not assigned in an operational support role) are considered nonfield team members, as defined by this HASP. A person will be considered "onsite" when they are present in the designated work area boundary (described in detail in Section 7).

Nonfield team members are considered occasional site workers in accordance with 29 CFR 1910.120/1926.65, "Hazardous Waste Operations and Emergency Response," and must receive site-specific HASP training before entering beyond the project site's designated work area. In addition, they must meet all required training for the area of the site they have a need to access, based on the groundwater-monitoring activity taking place. A site supervisor (e.g., HSO or FTL) also will supervise nonfield team personnel who have not completed their supervised field experience in accordance with 29 CFR 1910.120/1926.65, "Hazardous Waste Operations and Emergency Response."

2.2.6 Visitors

All visitors with official business at a groundwater-monitoring project site (including BBWI personnel, representatives of DOE, and state or federal regulatory agencies) may only proceed into the designated work area during operational activities after meeting the following requirements:

- Receiving site-specific HASP training or hazard briefing, based on specific tasks taking place

- Signing a HASP training roster and providing proof of meeting all training requirements specified in Section 4 (or required access training for the area to be visited when groundwater-monitoring tasks are not being conducted)

- Signing applicable job safety analysis training rosters for the particular operation or area(s) to be accessed

- Providing objective evidence of personal protective equipment (PPE) training and wearing the appropriate PPE for the area of the site accessed.

A fully trained task-site representative (e.g., FTL or HSO [or a designated alternate]) will escort visitors when entering the project site's designated work area, as site conditions warrant and as deemed appropriate by the FTL.

Note:	Visitors will not be allowed into controlled work areas during certain maintenance tasks (e.g., hoisting and rigging of well pumps) to minimize risks to visitors. The determination as to any visitor's "need" for access into the controlled work area will be made by the FTL in consultation with the HSO and safety professional (as appropriate).

A casual visitor to the task site is a person who does not have a specific task to perform or other official business to conduct at the project site. **Casual visitors are not permitted on any project site.**

2.2.7 Health and Safety Officer

The HSO is the person assigned to the task site who serves as the primary contact for all health and safety issues. The HSO advises the FTL on all aspects of health and safety and is authorized to stop work at the task site if any operation threatens worker or public health or safety. The HSO is authorized to verify compliance to the HASP, conduct inspections and self-assessments, require and monitor corrective actions, and monitor decontamination procedures (as appropriate). The SH&QA professionals at the task site (i.e., safety professional, IH, RCT, environmental coordinator, and facility representative) support the HSO, as necessary.

Persons assigned as the HSO, or alternate HSO, must be qualified to recognize and evaluate hazards and will be given the authority to take or direct actions to ensure that workers are protected. Other HSO task site responsibilities must not interfere with the HSO's primary role at the task site, even though the HSO may also be the IH, safety professional, or, in some cases, the FTL (depending on the hazards and complexity of the activity involved). If the HSO must leave the site, the HSO will appoint an alternate individual to fulfill this role, and their identity will be communicated to project personnel.

2.2.8 Industrial Hygienist

The assigned IH is the primary source for information regarding exposure assessments for groundwater monitoring chemical, physical, and biological hazards at the project site. The IH assesses the potential for worker exposures to hazardous agents according to INEEL safety and health manuals (i.e., *Manual 14–Safety and Health–Occupational Safety and Fire Protection* and *Manual 14B–Safety and Health–Occupational Medical and Industrial Hygiene*), MCPs, and accepted industry industrial hygiene practices and protocol. By participating in project planning, the IH assesses and recommends appropriate hazard controls for the protection of site personnel, operates and maintains airborne sampling and monitoring equipment, reviews for effectiveness, and recommends and assesses the use of PPE required in this HASP (recommending changes as appropriate).

The IH, supervisor, or HSO will refer personnel showing health effects (i.e., signs and symptoms) resulting from possible exposure to hazardous agents to an Occupational Medical Program (OMP) physician. The IH may have other duties at the site, as specified in other sections of this HASP or in PRDs or MCPs.

2.2.9 Safety Professional

The assigned INEEL safety professional reviews work packages, observes site activity, assesses compliance with the INEEL safety and health manuals, advises the FTL on required safety equipment, and recommends solutions to safety issues and concerns that arise at the task site. The safety professional may conduct periodic inspections in accordance with MCP-3449, "Safety and Health Inspections," and may have other duties at the task site, as specified in other sections of this HASP or in PRDs and MCPs. Copies of any safety and health inspections will be kept in the field file.

2.2.10 Fire Protection Engineer

The assigned fire protection engineer reviews the work packages, conducts preoperational and operational fire hazard assessments, and provides technical guidance to project personnel regarding all fire protection issues. The INEEL Fire Department also might need to be advised of fuel storage areas (if required) and will provide authorization for all hot work operations performed at the project site during times of high-to-extreme fire danger.

2.2.11 Waste Area Group Facility Interface

The WAG facility interface serves as the POC for coordination with the SAD, as appropriate. The WAG facility interface provides advance notice to the SAD (or designee) of scheduled activities (including documents requiring review or approvals) that affect site area operations and provides advance notice of site area operations that impact ER project activities. The WAG facility interface is responsible for:

- Coordinating all activities with the appropriate facilities' maintenance and operations managers
- Interfacing with the facility landlord regarding office space
- Consulting with the PM, PE, and FTL on field labor staffing and facility support.

2.3 Facility Support Staff

2.3.1 Facility Site Area Director

The facility SAD reports to the director of site operations and interfaces with the facility operations manager. The facility SAD is responsible for the following functions and processes in the area:

- Ensuring that all work processes and work packages performed in the facility area are done properly
- Establishing and executing a monthly, weekly, and daily operating plan for the facility area
- Executing the SH&QA Program for the facility area
- Executing the ISMS and Voluntary Protection Program (VPP) for the facility area

- Executing that portion of the Voluntary Consent Order that pertains to the facility area
- Correcting the root cause functions of the accident investigation in the facility area
- Correcting the root cause functions of the Voluntary Consent Order for the facility area
- Authorizing startup for new, or a restart of, activities within the SAD's area of jurisdiction.

2.3.2 Radiological Engineer

The radiological engineer is the primary source of information and guidance relative to the evaluation and control of radioactive hazards at the project. The radiological engineer will provide engineering design criteria, review containment structures, and make recommendations to minimize health and safety risks to project personnel. The radiological engineer will estimate radiation exposure and provide as low as reasonably achievable (ALARA) evaluations, identify the type(s) of radiological monitoring equipment necessary for the work, advise the FTL and RCT of changes in monitoring or PPE, and advise personnel on project evacuation and reentry. The radiological engineer may have other duties, as specified in other sections of this HASP or *Manual 15B–Radiation Protection Procedures*.

2.3.3 Radiological Control Technician

The assigned RCT is the primary source of information and guidance on radiological hazards and will be available during all operations where RCT coverage is required. The RCT's responsibilities include performing radiological surveying of the project, equipment, and samples; providing guidance for radioactive decontamination of equipment and personnel; and accompanying the affected personnel to the nearest INEEL medical facility for evaluation if significant radionuclide contamination occurs. The RCT must notify the FTL and HSO of any radiological occurrence that must be reported as directed by *Manual 15B–Radiation Protection Procedures*. The RCT may have other duties at the project, as specified in other sections of this HASP or in INEEL MCPs or PRDs.

3. RECORDKEEPING REQUIREMENTS

3.1 Industrial Hygiene and Radiological Monitoring Records

When IH support is required, the IH will record airborne monitoring and sampling data (both area and personal) collected for exposure assessments in the INEEL Hazards Assessment and Sampling System. All monitoring and sampling equipment will be maintained and calibrated according to INEEL procedures and the manufacturer's specifications. Industrial hygiene airborne monitoring and sampling exposure assessment data are treated as limited access information and maintained by the IH according to the requirements in *Manual 14B–Safety and Health–Occupational Medical and Industrial Hygiene*. Any airborne monitoring or sampling done by non-industrial hygiene/safety personnel will be documented in a project-controlled logbook to be reviewed by the IH.

When RCT support is required, the RCT will maintain a logbook of radiological monitoring, daily project operational activities, and instrument source checks and calibrations. Radiological monitoring records are maintained in accordance with the requirements in *Manual 15B–Radiation Protection Procedures*.

Project personnel, or their representative(s), have a right to access both IH and RCT monitoring and sampling (both area and personal) data. Results from monitoring data also will be communicated to all field personnel, as deemed appropriate, during daily POD meetings and formal prejob briefings.

3.2 Field Team Leader and Sampling Logbooks

The FTL will keep a record of daily task-site events in the FTL logbook. The FTL also will ensure that a logbook is maintained of all sampling activities and samples collected. The sample logbook may be maintained by any member of the sampling crew. All logbooks must be obtained from Administrative Record and Document Control (ARDC). Completed sample logbooks must be submitted to the Sampling and Analysis Management Department (formerly the Sample Management Office) within 6 weeks of project completion. Logbooks will be maintained in accordance with the requirements of MCP-1194, "Logbook Practices for ER and Deactivation, Decontamination, and Decommissioning Projects."

3.3 Site Attendance Record

The site attendance record will be used to keep a record of all personnel (i.e., field team members and nonfield team members) onsite each day and to assist the area warden with conducting personnel accountability should an evacuation take place (see Section 11 for emergency evacuation conditions). For small projects with few personnel involved, the FTL logbook may suffice for recording site attendance. On larger projects, a separate attendance logbook may be used, as deemed appropriate by the FTL. The FTL is responsible for maintaining the site attendance record and for ensuring that all personnel on the project site sign in.

3.4 Administrative Record and Document Control

The ARDC will organize and maintain data and reports generated by ER field activities. The ARDC maintains a supply of all controlled documents and provides a documented system for the control and release of controlled documents, reports, and records. The ARDC maintains copies of the management plans for ER, this HASP, the *Quality Assurance Project Plan for Waste Area Groups 1, 2, 3, 4, 5, 6, 7, 10, and Inactive Sites* (DOE-ID 2002), and other documents pertaining to this work.

4. PERSONNEL TRAINING

All INEEL personnel will receive training, as specified in 29 CFR 1910.120/1926.65, "Hazardous Waste Operations and Emergency Response"; *Manual 14A–Safety and Fire Protection–Occupational Safety and Fire Protection*; *Manual 14B–Safety and Health–Occupational Medical and Industrial Hygiene*; *Manual 12–Training and Qualification*; and any facility-specific training (as applicable). Table 4-1 summarizes the project-specific training requirements for personnel. Specific requirements for personnel requiring access to the project sites may vary depending on the hazards associated with their individual job assignment and required access into established controlled work areas. Table 4-1 lists only project-specific training and does not include all potential facility or other general company training required for personnel.

Changes (i.e., addition or elimination) to the training requirements listed in Table 4-1 might be necessary, based on changing field conditions. The HSO with concurrence from the FTL, PM, RCT, and IH (as applicable) must approve any changes to the requirements listed in Table 4-1. These changes should be based on site-specific conditions and generally will be considered a minor change to the HASP—as defined by Form 412.11, "DMCS Document Action Request (DAR)," instructions—since they are administrative in nature.

4.1 General Training

All project personnel are responsible for meeting required training (including applicable refresher training). Evidence of training will be maintained at the site or will be available electronically (e.g., Training Records and Information Network [TRAIN]). Nonfield team personnel and visitors must be able to provide evidence of meeting required training for the area of the site they wish to access before being allowed into project areas.

Examples of acceptable written training documents include a 40-Hour OSHA Hazardous Waste Operations and Emergency Response (HAZWOPER) card, a respirator authorization card, a medic/first aid training card, or a copy of an individual's or department's (INEEL only) TRAIN system printout demonstrating completion of training. Upon validation, a copy of the training certificate issued by an approved non-INEEL training vendor or institution also is acceptable proof of training. As a minimum, all personnel who access groundwater-monitoring locations are required to wear PPE and must provide objective evidence of having completed INEEL computer-based PPE training (00TRN288) or equivalent, in accordance with 29 CFR 1910, Subpart I, "Personal Protective Equipment." See Section 9 of this HASP for details on PPE requirements.

4.2 Project-Specific Training

The HSO (or designee) will conduct project-specific HASP training before commencement of work at groundwater-monitoring project sites. This training will consist of a complete review of a controlled copy of the project HASP and attachments, applicable JSAs (if required), work orders, and other applicable work control and authorization documents with time for discussion and questions. Project-specific training can be conducted in conjunction with, or separate from, the required formal prejob briefing (MCP-3003, "Performing Pre-Job Briefings and Documenting Feedback").

Table 4-1. Required training for site personnel.

Training	FTL, HSO, and Samplers	Other Field Team Members	Access into the Designated or Controlled Work Area	Access to Areas Outside Designated or Controlled Work Area
40-Hour HAZWOPER[a] - Operations	Yes	b	b	
24-Hour HAZWOPER[a] - Operations		b	b	
8-Hour HAZWOPER site supervisor	Yes			
Project-specific HASP training[c]	Yes	Yes	Yes	
Project-site orientation briefing[d]				Yes
Facility access training (where applicable)	Yes	Yes	e	e
Fire extinguisher training (or equivalent)	f	f		
CPR, medic/first aid	f	f		
Respirator training (contingency only)	g	g	g	
DOE Radiological Worker I/II	h	h	h	
Site access training (blue or orange card)	Yes	Yes	Yes	Yes

Note: Shaded fields indicate specific training is not required/applicable.

a. Includes 8-hour HAZWOPER refresher training, as applicable, and supervised field experience as follows—40-hour HAZWOPER = 24-hour supervised field experience, 24-hour HAZWOPER = 8-hour supervised field experience.

b. The HSO will determine the 40-hour or 24-hour HAZWOPER training requirement based on the nature of the groundwater-monitoring tasks and potential for exposure to contaminants or safety hazards.

c. Includes project-specific hazardous communications, site access and security, and decontamination and emergency response actions, as required by 29 CFR 1910.120(e), "Training."

d. Orientation includes briefing of site hazards, designated work areas, emergency response actions, and PPE requirements. Personnel receiving the project-site orientation briefing only are limited to the areas outside designated work areas and must be escorted by a fully HASP-trained project supervisor or designee.

e. Required for unescorted access in some areas or may be escorted.

f. At least one trained person must be onsite when the field team is working; the HSO will determine the appropriate number of personnel requiring training.

g. Only required if entering area requiring respiratory protection (e.g., action levels exceeded, IH sampling shows respirators required).

h. As required based on project duties and site zone access requirements.

CPR = cardiopulmonary resuscitation
DOE = U.S. Department of Energy
FTL = field team leader
HASP = Health and Safety Plan
HAZWOPER = Hazardous Waste Operations and Emergency Response
HSO = health and safety officer
IH = industrial hygienist
PPE = personal protective equipment

At the time of project-specific HASP training, personnel training records will be checked and verified to be current and complete for all the training requirements shown in Table 4-1. Once the HSO (or designee) has completed site-specific training, personnel will sign Form 361.25, "Group Read and Sign Training Roster," or equivalent, indicating that they have received this training, understand the project tasks and associated hazards and mitigations, and agree to follow all HASP and other applicable work control and safety requirements. Form 361.47, "HWO Supervised Field Experience Verification," (or equivalent) is available on the INEEL Intranet under "Forms."

A trained HAZWOPER 8-hour supervisor (FTL or other HAZWOPER supervisor-trained person) will monitor each newly 24-hour or 40-hour trained worker's performance to meet the 1 or 3 days of

supervised field experience, respectively, in accordance with 29 CFR 1910.120(e), "Training." Following the supervised field experience period, the supervisor will complete Form 361.47, "Hazardous Waste Operations (HazWoper) Supervised Field Experience Verification," or equivalent, to document the supervised field experience.

Note 1:	Supervised field experience is only required if personnel have not previously completed this training at another CERCLA site (documented) or if they are upgrading from 24- to 40-hour HAZWOPER training. A copy must be kept at the project site as evidence of training or be available electronically.
Note 2:	Completed training project forms (Form 361.47 or equivalent) must be submitted to the ER training coordinator for inclusion in the TRAIN system within 5 working days of completion.

4.3 Daily Plan-of-the-Day Briefing and Lessons Learned

The FTL (or designee) will conduct a daily POD meeting for all personnel entering the task site(s). During this meeting, daily tasks will be outlined; hazards identified; hazard controls, mitigation, and work zones established; PPE requirements discussed; and employees' questions answered. At the completion of this meeting, any new work control documents will be read and signed (e.g., radiological work permits and JSAs).

Particular emphasis will be placed on lessons learned from the previous day's activities and how tasks can be completed in the safest, most efficient manner. All personnel will be asked to contribute ideas to enhance worker safety and mitigate potential exposures at the project sites. This POD will be conducted as an informal meeting and the only required record will be to document the completion of the POD in the FTL logbook.

5. OCCUPATIONAL MEDICAL SURVEILLANCE PROGRAM

Task site personnel will participate in the INEEL OMP, as required by 29 CFR 1910.120/1926.65, "Hazardous Waste Operations and Emergency Response." Medical surveillance examinations will be provided before assignment, annually, and after termination of HAZWOPER duties or employment (as required). This includes:

- Personnel who are, or might be, exposed to hazardous substances at or above the OSHA permissible exposure limit (PEL) or published exposure limits, without regard to respirator use for 30 or more days per year
- All employees who are injured, become ill, or develop signs or symptoms due to possible overexposure involving hazardous substances or health hazards from an emergency response or hazardous waste operation
- All employees who wear a respirator for 30 days or more a year or as required by 29 CFR 1910.134, "Respiratory Protection."

Personnel who wear a respirator in performance of their job, or who are required to take respirator training to perform their duties under this plan, must participate in the medical evaluation program for respirator use at least annually, as required by 29 CFR 1910.134, "Respiratory Protection."

A single copy of the groundwater monitoring project HASP, job hazard analysis requirements, required PPE, confined space entry (as applicable), and other exposure-related information will be made available (upon request) to the OMP physician and subcontractor physicians conducting medical surveillance for employees participating in this project. Exposure monitoring results and hazard information furnished to the OMP physician must be supplemented or updated annually as long as the employee is required to maintain a hazardous waste/material employee medical clearance.

The OMP physician will evaluate an employee's physical ability to perform the work assigned, as identified in the site HASP or other job-related documentation. A documented medical clearance (e.g., physician's written opinion) will be provided to the employee and line management stating whether the employee has any detected medical condition that would place him or her at increased risk of material health impairment from work in hazardous waste operations, emergency response operations, respirator use areas, and confined space entry areas (as applicable). The physician may impose restrictions on the employee by limiting the amount and type of work performed.

5.1 Subcontractor Workers

As required, subcontractor project personnel will participate in a subcontractor medical surveillance program that satisfies the requirements of 29 CFR 1910.120/1926.65, "Hazardous Waste Operations and Emergency Response." This program must make medical examinations available before assignment, annually, and after termination of hazardous waste duties. The physician's written opinion (as defined by 29 CFR 1910.120(f)(7), "Physician's Written Opinion," or equivalent) will serve as documentation that subcontractor personnel are fit for duty.

Medical data from the subcontractor employee's private physician, collected pursuant to hazardous material worker qualification, will be made available to the INEEL OMP physicians upon request. In addition, the subcontractor employee's past radiation exposure histories must be submitted to the INEEL radiation dosimetry and records section in accordance with *Manual 15B–Radiation Protection Procedures;* MCP-188, "Issuing TLDs and Obtaining Personnel Dose History"; and MCP-2381, "Personnel Exposure Questionnaire."

5.2 Injuries on the Site

According to INEEL policy, an OMP physician must examine all injured personnel if (1) an employee is injured on the job, (2) an employee is experiencing signs and symptoms consistent with exposure to a hazardous material, or (3) there is reason to believe that an employee has been exposed to toxic substances or physical or radiological agents in excess of allowable limits.

Note:	In the event of an injury, subcontractor employees will be taken to the closest INEEL medical facility to have an injury stabilized before transport to the subcontractor's treating physician or medical facility.

In the event of a known or suspected injury or illness due to exposure to a hazardous substance or physical or radiological agent, the employee will be transported to the nearest INEEL medical facility for evaluation and treatment (as necessary). The HSO is responsible for obtaining as much of the following information as is available and to accompany the individual to the medical facility:

- Name, job title, work (site) location, and supervisor's name and phone number
- Substance, physical or radiological agent exposed to (known or suspected), and material safety data sheet (MSDS), if available
- Nature of the incident/injury or exposure and related signs or symptoms of exposure
- First aid or other measures taken
- Locations, dates, and results of any airborne exposure monitoring or sampling
- Personal protective equipment in use during this work (e.g., type of respirator and cartridge used).

Further medical evaluation will be determined by the treating or examining physician according to the signs and symptoms observed, hazard(s) involved, exposure level, and specific medical surveillance requirements established by the OMP director in compliance with 29 CFR 1910.120/1926.65, "Hazardous Waste Operations and Emergency Response."

As soon as possible after an injured employee has been transported to the INEEL medical facility, the FTL or designee will make notifications, as indicated in Section 11 of this HASP.

5.3 Substance-Specific Medical Surveillance

Extensive sampling and analysis data exist for water samples collected from wells located across the INEEL. Based on these data, only trace amounts of radionuclide and chemical contaminants have been detected in water samples and are considered below concentrations that would yield airborne fractions approaching health-based occupational exposure values (e.g., OSHA PELs or American Conference of Governmental Industrial Hygienists [ACGIH] Threshold Limit Values [TLVs]) for these contaminants. Therefore, substance-specific medical surveillance is not anticipated for site workers. If new contaminants of concern are identified during the course of groundwater-monitoring tasks, exposures will be evaluated and quantified to determine if a substance-specific standard applies. If regulatory-mandated substance-specific standard action levels are triggered, then affected personnel will be enrolled in applicable medical surveillance programs.

6. ACCIDENT PREVENTION PROGRAM

Groundwater-monitoring activities primarily present physical hazards and limited potential chemical hazards to personnel conducting tasks. However, scope of groundwater-monitoring work includes not only well sampling tasks, but also more complex and hazardous tasks (such as well installation, maintenance, and decommissioning) that require more detailed planning and hazard mitigation strategies. It is important that all personnel participating in groundwater-monitoring activities understand and follow the project-specific requirements of this HASP, JSA, hazard mitigation and PPE requirements, and applicable work package(s) steps and hold points (where applicable) to control hazards.

Engineering controls, hazard isolation, work practices and training, and the use of PPE will all be implemented to eliminate or mitigate potential hazards and personnel exposures. However, all groundwater-monitoring personnel have responsibilities in the hazard identification and control process. These include:

- Participate in the hazard identification process based on the scope of work
- Participate in the hazard walk-downs of the areas where groundwater-monitoring activities will take place
- Assist in the completion of hazard screening checklists or hazard profile screening checklists (as applicable)
- Attend the prejob briefing and subsequent POD meetings to ensure that all workers have a clear understanding of the scope of work, associated hazards, and mitigation requirements

Note:	Ask the FTL for clarification **before signing the prejob attendance sheet and before starting work** if the scope of work, hazards identified, hazard mitigation (including PPE requirements), or work control documentation is not clearly understood.

- Recognize changing conditions, scope of work, and new hazards requiring mitigation and take the appropriate action to communicate these conditions to the FTL
- Halt activities or stop work (where appropriate in accordance with MCP-553, "Stop Work Authority") until new scope or hazards are adequately addressed in work control documents and mitigation is in place.

All field team members must participate in the hazard identification and mitigation process for an accident prevention program to be effective. This process will be ongoing during the course of groundwater-monitoring activities and as additional tasks (scopes of work) are initiated. Feedback to the FTL and communication between workers regarding groundwater-monitoring lessons learned are critical for ensuring that tasks are being conducted in the safest and most efficient manner. The daily POD and postjob briefing provide a formal forum for sharing lessons learned and contributing ideas for safer and more efficient ways to do work. However, new ideas and lessons learned should be shared before work is conducted to be most effective.

6.1 Voluntary Protection Program and Integrated Safety Management

As part of operational excellence, the INEEL safety processes embrace the VPP and ISMS criteria, principles, and concepts. All levels of management are responsible for implementing safety policies and

programs and for maintaining a safe and healthy work environment. Project personnel and subcontractors are expected to take a proactive role in preventing accidents, ensuring safe working conditions for themselves and fellow personnel, and complying with all work control documents and procedures.

The ISMS is focused on the **system** side of conducting operations, and VPP concentrates on the **people** side of conducting work; however, both define work scope and identify, analyze, and mitigate hazards. The VPP is a process that promotes and encourages continuous safety improvement. However, it is not a requirement of any regulatory agency. The INEEL and affected subcontractors participate in VPP and integrated safety management for the safety of their employees. Additional information on VPP and ISMS can be found in Program Description Document (PDD) -1005, "Site Operations Manual." The five key elements of VPP and ISMS are:

VPP	ISMS
Management leadership	Define work scope
Employee involvement	Analyze hazards
Work site analysis	Develop and implement controls
Hazard prevention and control	Perform work within controls
Safety and health training	Provide feedback and improvement

6.2 General Safe-Work Practices

The following practices are mandatory for all INEEL and subcontractor personnel working on ER long-term groundwater-monitoring sites. All site visitors entering designated or controlled work areas must follow these practices. The FTL and HSO are responsible for ensuring that these hazard control practices are followed at the site.

Note: Failure to follow these practices may result in permanent removal from the site and other disciplinary actions.

- Access into designated or controlled work areas will be limited to authorized BBWI, subcontractor, and visitor personnel only.
- DO NOT enter controlled work areas or areas posted with DANGER signs unless authorized by the FTL.
- Comply with all safety signs, color codes, and barriers. DO NOT cross safety or radiological barriers unless you understand the hazard within and have the proper training to access the area. Adhere to PRD-5117, "Accident Prevention Signs, Tags, Barriers, and Color Codes."
- Personnel performing fieldwork shall obtain, ensure the operability of, and carry the following equipment in accordance with MCP-2725, "Field Work at the INEEL":
  - INEEL pager.
  - Two-way communications (mobile phone or INEEL radio).
  - Fire extinguisher or shovel.

- First aid kit that complies with MCP-2559, "Use of First Aid Kits."
- Hunter orange safety vest or hat (August 1 through December 31).

- Absolutely no eating, drinking, chewing gum or tobacco, smoking, applying cosmetics, or participating in any other practice that increases the probability of hand-to-mouth transfer and ingestion of materials will be allowed except in designated eating or break areas.
- Wear all prescribed PPE (minimum of Level D) and comply with PRD-5121, "Personal Protective Equipment," requirements.
- Be aware of walking and working surface conditions (wet, snow/mud/frost/ice covered), apply sand or salt (where appropriate), and wear adequate footwear to prevent slips and falls.
- Do not wear finger rings, loose clothing, wristwatches, and other loose accessories when within arm's reach of moving machinery.
- Report unsafe equipment, defective or frayed electrical cords, and unguarded machinery to the FTL or HSO.
- Ground-fault protection will be provided whenever electrical equipment is used outdoors.
- Project personnel will ensure that electrical equipment, wiring, cables, switches, and current overload protection devices meet applicable regulations and are maintained in a manner that provides project personnel protection from shock hazards and injury and prevents property damage in accordance with the requirements of MCP-3650, "Chapter IX Level I Lockouts and Tagouts"; MCP-3651, "Chapter IX Level II Lockouts and Tagouts"; and any facility-specific supplements.
- Keep all ignition sources at least 15 m (50 ft) from explosive or flammable environments, and use nonsparking, explosion-proof equipment (if advised to do so by a safety professional).
- Be alert for dangerous situations, strong or irritating odors, or airborne dusts or vapors. Report all potentially dangerous situations to the FTL.
- Check weather forecasts and be alert to changing weather conditions that could present hazards to personnel (lightning, high winds, winter storms, etc.).
- Be familiar with, understand, and follow project emergency procedures (see Section 11).
- Be familiar with the physical characteristics of the task site including, but not limited to, the following:
  - Wind direction.
  - Accessibility of fellow personnel, equipment, and vehicles.
  - Communications at the task site.
  - Major roads and means of access to and from the site.
  - Nearest water sources and fire-fighting equipment.

- All area and project warning devices and alarms.

- Capabilities and location of nearest incident response team and INEEL Fire Department.

- Prevent releases of hazardous materials, including those used at the task site. If a spill occurs, try to isolate the source (if possible, and if this does not create a greater exposure potential), and then report it to the FTL. Accidental releases of hazardous materials will need to be reported to applicable facility personnel, as stated in Section 11 of this HASP. Appropriate spill response kits, or other confinement and absorbent materials, will be maintained at the task site.

- Report all broken skin or open wounds to the HSO or FTL. The OMP physician will determine the method for bandaging the wound and will recommend PPE to be worn by the injured employee.

Note:	Personnel with unprotected wounds will not be permitted to enter the controlled work area without proper bandaging.

- Personnel working in the controlled work area will implement the "buddy system" (see Subsection 6.5).

- All personnel have the authority to initiate **STOP WORK** actions according to MCP-553, "Stop Work Authority."

6.3 As Low as Reasonably Achievable Principles

Groundwater-monitoring data from existing wells, lysimeters, and purge water have demonstrated that radiological contamination from groundwater at these sites presents only a minimal radiological exposure hazard (external or contamination). Based on this minimal hazard potential, ALARA principles will be followed where the potential exists for contact with water with trace radionuclide contaminants.

During radiological groundwater-monitoring tasks, radiological contamination monitoring will be conducted at specific locations based on previous groundwater radionuclide sampling data and on the potential for encountering contamination during maintenance and decommissioning tasks, as specified in TPRs, and as deemed appropriate by RadCon personnel. If contamination is detected at levels that alert personnel to changing conditions (e.g., above background or radiological work permit [RWP] limits, if written), personnel will isolate potentially contaminated equipment or surfaces and halt activities until adequate controls can be implemented.

All radiation exposure to project personnel shall be controlled such that radiation exposures are well below regulatory limits and that there is no radiation exposure without commensurate benefit. Unplanned and preventable exposures are considered unacceptable. The goal is to eliminate or minimize radiation exposures, and all project personnel are responsible for following ALARA principles and practices. Personnel working at the site will strive to keep both external and internal radiation doses ALARA by adopting the practices described in the following subsections.

6.3.1 External Radiation Dose Reduction

Basic protective measures used to reduce external doses of radiation include the following items:

- Minimizing time in radiation areas

- Maximizing the distance from known sources of radiation
- Using radiation protection shielding.

Personnel will adhere to all radiological postings at the site, wear required dosimetry, and contact an RCT if contamination is suspected of being encountered during any groundwater-monitoring task. An RWP may be written for specific groundwater-monitoring maintenance, decommissioning, or abandonment operations—as deemed appropriate by RadCon personnel and in accordance with MCP-7, "Radiological Work Permit."

6.3.2 Internal Radiation Dose Reduction

An internal dose of radiation is a result of radioactive material being taken into the body. Radioactive material can enter the body through inhalation, ingestion, absorption through wounds, or injection from a puncture wound. Reducing the potential for radioactive material to enter the body is critical to avoiding internal doses of radiation. Monitoring for contamination will be conducted using hand-held instruments and in accordance with MCP-357, "Job-Specific Air Sampling/Monitoring"; as deemed appropriate by RadCon personnel; and as specified in applicable RWPs.

6.4 Chemical Contaminant Exposure Avoidance

Groundwater-monitoring data from existing wells, lysimeters, and purge water have demonstrated that chemical contaminant levels are low. Based on the water matrix these contaminants are in and the minimal exposure time for personnel conducting sampling and handling tasks, the potential for approaching health-based exposure limits (i.e., PELs or TLVs) is considered minimal to negligible.

Other sources for chemical exposure include:

- Acids used to preserve water samples
- Fuels used for generators and powered equipment
- Bentonite, cement, and concrete used during well or borehole abandonment and installation tasks
- Small amounts of petroleum-based lubricants that might be used during maintenance tasks.

Some of these contaminants could pose a contact hazard from skin, mucous membrane, or eye contact; the implementation of avoidance practices in conjunction with PPE usage will serve to minimize the potential for exposures. Some methods of exposure avoidance include:

- Isolating known sources of contamination through the use of engineering controls or barriers
- Using a laboratory hood for acid handling and sample preservation tasks
- Wearing all required PPE, inspecting all pieces before donning, and taping all seams
- Donning and doffing PPE following radiological protocols if additional outer protective clothing is required
- Washing hands, face, and other exposed body surfaces before eating, drinking, smoking, or participating in other activities that could provide a pathway for contaminants.

6.5 The Buddy System

The two-person or "buddy" system will be used at groundwater-monitoring sites when a controlled work area has been established. The buddy system requires workers to assess and monitor their "buddy's" mental and physical well being during the course of the workday. A "buddy" must be able to:

- Provide assistance
- Verify the integrity of PPE (when required)
- Observe their partner for signs and symptoms of heat stress, cold stress, or contaminant exposure
- Notify other personnel in the controlled work area if emergency assistance is needed.

Workers must be able to see or hear and effectively communicate with their "buddy" at all times when in the controlled work area.

7. SITE CONTROL AND SECURITY

Site control and security will be maintained at ER long-term sitewide groundwater-monitoring locations during operational activities to prevent unauthorized personnel from entering the work area. Entry into and exit out of these areas will be controlled through the appropriate use of barriers, signs, and other measures in accordance with PRD-5117, "Accident Prevention Signs, Tags, Barriers, and Color Codes."

Based on the nature of the groundwater-monitoring tasks to be completed, a graded approach with two types of site control designations will be used based on the potential hazards, complexity of work tasks, and duration of sampling events. The two types of work areas are:

- Designated work areas (DWAs) (established for low-hazard routine monitoring and maintenance tasks)

- Controlled work areas (CWAs) (established for higher hazard maintenance, installation, decommissioning, and abandonment tasks).

The primary differences between the types of work areas will be the size of the area, method of delineation, and postings, which are determined by the operations being conducted and associated hazards. The HSO in conjunction with the FTL and RadCon personnel (where radiological concerns exist) will determine the type of work area to be established.

Personnel not directly involved with groundwater-monitoring activities will be excluded from entering these work areas. Visitors may be admitted into work areas provided they are (1) on official business, (2) authorized by the FTL, and (3) have met all the site-specific training requirements for the area they will be accessing, as listed on Table 4-1.

Note: Visitors will not be allowed into controlled work areas during certain maintenance, installation, decommissioning, or abandonment tasks to minimize risks to workers and visitors. The FTL in consultation with the HSO, RadCon personnel, IH, and Safety personnel (as appropriate) will make the determination as to any visitor's need for access into the controlled work area.

Figures 7-1 and 7-2 illustrate examples of a DWA and CWA, respectively. These figures represent the general configuration of the work areas; they are not intended to provide an exact layout, position of equipment, or scale. Changing field conditions and industrial hygiene or RadCon monitoring could warrant reconfiguring the layout, size, designation, and orientation of these work areas. In addition, entrance and egress points may change based on these same factors. Changes, additions, or elimination of areas will be the decision of the FTL in conjunction with the HSO, RadCon (as appropriate), safety professional, and IH, based on monitoring data and the nature of the activities taking place.

All potential safety, chemical, and radiological hazards will be evaluated when delineating each work area location and size. Barriers (e.g., rope, cones, and printed ribbon) will be used for delineation and demarcation. Where warranted, designated traffic routes also may be established. These areas also will be posted to prevent inadvertent entry by unauthorized personnel.

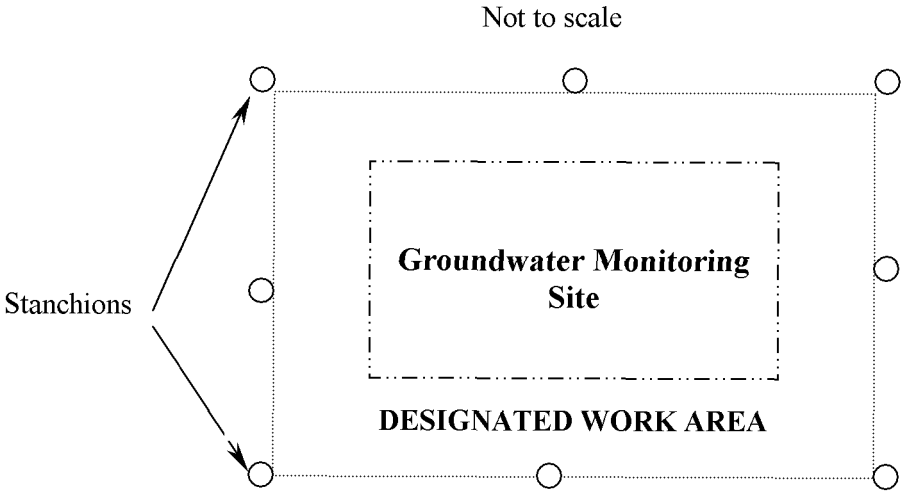

Figure 7-1. Example configuration for a groundwater-monitoring designated work area.

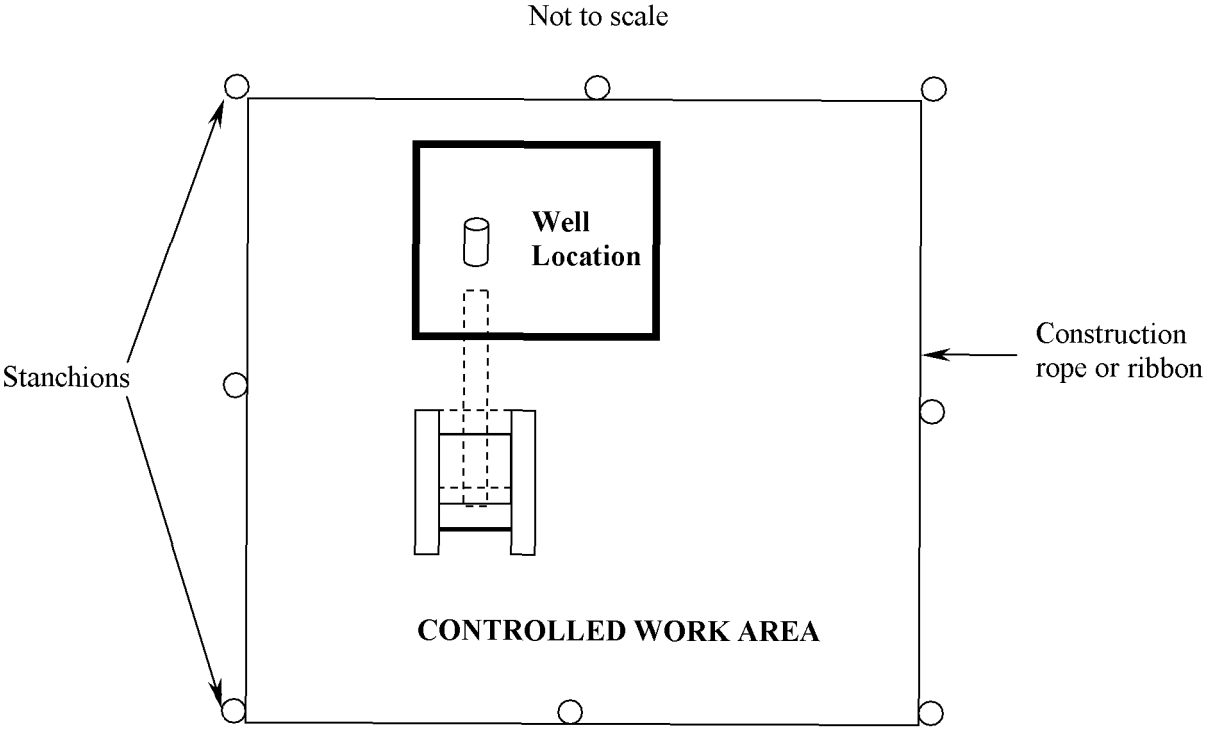

Figure 7-2. Example configuration for a groundwater-monitoring controlled work area.

Note: The safety professional and IH will assist the HSO in establishing the access requirements for the truck traffic routes, designated work areas, and for the project-based equipment in use.

7.1 Designated Work Area

The DWAs established for groundwater-monitoring tasks will consist of the area immediately around the well being monitored and an area large enough to encompass associated field measurement and sampling equipment. This type of work area will be established where a more restrictive designated work area would not lend itself to low-hazard routine groundwater monitoring, measurement, or maintenance tasks of short duration. Typically, the boundary of the DWA will be marked with cones or stanchions and generally will not be delineated with rope or ribbon or include other demarcation. All personnel who enter the DWA will wear the appropriate level of PPE for the degree and type of hazards present, as listed in Section 9.

Generally, support facilities (e.g., project administrative trailer, vehicle parking, additional emergency equipment, extra PPE, and stored monitoring and sampling equipment) will be located outside the DWA. Visitors who do not have appropriate training to access the DWA will be restricted from entering this area during groundwater-monitoring operations.

7.2 Controlled Work Area

The CWAs will be large enough to encompass the equipment and nature of the tasks being conducted to prevent personnel not assigned to the project task and visitors from being exposed to potential safety and health hazards associated with the groundwater-monitoring tasks. This type of work area will be established where a more restrictive area is required based on increased hazards associated with groundwater-monitoring maintenance, installation, decommissioning, or abandonment tasks. Typically, the boundary of the CWA will be marked with a combination of stanchions or posts and delineated with rope or ribbon and will include warning signs (e.g., construction area) or other demarcation. Only the minimum number of personnel required to safely perform the project tasks will be allowed into the CWA. The CWA is controlled during all groundwater-monitoring operations, and an entry and exit point will be established at the periphery of the CWA to regulate the flow of personnel and equipment. All personnel who enter the CWA will wear the appropriate level of PPE for the degree and type of hazards present, as listed in Section 9.

Factors that will be considered when establishing the CWA boundary include (1) air monitoring data, (2) equipment in use, and (3) the physical area necessary to conduct site operations. The boundary may be expanded or contracted, as this information becomes available, based on the aforementioned evaluations. The HSO in conjunction with the safety professional and IH will establish the CWAs. All CWAs will be delineated and posted with the appropriate signage based on the hazard(s) being controlled.

7.3 Truck Traffic Routes

If determined to be required based on project activities, truck traffic routes may be established for trucks entering the CWA. These routes will include a turnaround area (where feasible) and may be delineated with cones or equivalent markers if an existing roadway does not exist. All drivers will be instructed to use these traffic routes when entering and leaving the CWA; workers will be restricted from entering this area when truck or equipment traffic is using the routes.

7.4 Site Security

All ER long-term groundwater-monitoring project sites will be secured and controlled during operational times, as described in previous sections. During off-hours and weekends, locations inside a facility are controlled by the normal facility security access requirements. Generally, locations outside a facility will not require securing during non-operational times unless the site is left in a configuration that continues to be worked (CWA with heavy equipment left in the area, well components exposed, etc.). Under these circumstances, CWA rope boundaries and posting will be left in place during off-hours and weekends to prevent personnel from inadvertently entering the CWA.

The FTL has the primary responsibility for ensuring that the CWA is secured. The HSO and RadCon (where required) will ensure that all health and safety and radiological postings of the area are intact when leaving the site and will be responsible for maintaining them for the duration of the project. Personnel are trained on site access and control requirements during project-specific HASP training and will not cross roped areas without the proper training and authorization, regardless of whether a sign is in place or not.

Note:	Signs routinely are lost because of high winds and will be replaced as soon as possible the next working day following discovery.

7.5 Designated Eating and Smoking Areas

Ingestion of hazardous substances is possible when workers do not practice good personal hygiene habits. It is important to wash hands, face, and other exposed skin thoroughly after completion of work and before smoking, eating, drinking, and chewing gum or tobacco. The designated eating/smoking areas for the project personnel will be the INEEL-established eating/smoking areas. Personnel must comply with all INEEL smoking policies, including disposing of smoking materials in the proper receptacle. The project safety professional will be the single point of contact for establishing any smoking area outside a facility and such areas may not be used at certain times of the year due to high or extreme fire danger. **Smoking, chewing, eating, applying lip balm/cosmetics, and drinking are not allowed within the site work areas.**